ABSTRAK

Kajian Produksi dan Analisis Kelayakan Finansial Tepung Buah Kolang-Kaling (*Arenga pinnata merr*) di Kabupaten Lampung Barat

Oleh:

Suci Hardina Rahmawati

Buah kolang-kaling berasal dari tanaman aren yang terdapat pada buah betina. Kabupaten Lampung Barat merupakan penghasil buah kolang-kaling terbesar di Provinsi Lampung. Penelitian ini memanfaatkan buah kolang-kaling menjadi tepung buah kolang-kaling ,untuk memperpanjang masa simpan dan memudahkan proses pengangkutan serta menambah manfaat dari produk buah kolang-kaling. Tujuan penelitian ini 1) Mengembangkan model matematika pengeringan untuk mendapatkan waktu dan suhu terbaik, 2) Megembangkan penggunaan pelarut untuk mendapatkan pengaruh konsentrasi pelarut terhadap rendemen galaktomanan dan menganalisis karakteristik tepung serta mengidentifikasi senyawa galaktomanan pada tepung buah kolang-kaling terbaik, 3) Menganalisis kelayakan finansial tepung buah kolang-kaling (*Arenga pinnata Merr*) di Kabupaten Lampung Barat. Metode penelitian pada tahap 1 dilakukan dengan mengeringkan buah-kolang-kaling menggunakan oven dengan variabel waktu (1 sampai 8 jam) dan variabel suhu (50°C sampai 110°C). Metode tahap 2 yaitu dengan maserasi dengan penambahan asam sitrat dan natrium bisulfit kemudian dilakukan analisis galaktomanan, proximate, OHC, WHC, kadar polifenol, LCMS dan FTIR. Metode tahap ke 3 yaitu dilakukan dengan wawancara expert dan survey lapangan. Hasil penelitian pada tahap pertama diperoleh model matematika yang sesuai dengan karakteristik bahan baku adalah *Midili kucuk* dengan persamaan matematika Mr=0,9683exp(−0,0475$t^{0,8051}$) + 0,0021t. Dari persamaan model matematika diperoleh suhu dan waktu terbaik berdasarkan nilai R^2= 0,9484 yang paling tertinggi dan mendekati 1, nilai tersebut diperoleh pada suhu 100°C dengan waktu 3 jam. Penelitian tahap 2 diperoleh rendemen terbaik 41,51% dengan konsentrasi asam sulfat 0,1% (b/b) dengan waktu maserasi terbaik 90 menit. Perlakuan dengan penambahan asam sitrat dan variasi konsentrasinya berbeda nyata pada taraf kepercayaan 5%. Rendemen terbaik dari penambahan natrium bisulfit 45,72% dengan konsentrasi natrium bisulfit 0,2% (b/b) dengan waktu maserasi terbaik 60

menit, dan berbeda nyata pada taraf kepercayaan 5%. Kandungan galaktomanan terbaik dengan penambahan natrium bisulfit sebesar 2,01%, penambahan asam sitrat 1,95% dan tepung tanpa perlakuan 0,80%. Penelitian tahap 3 diperoleh nilai NPV sebesar Rp. 76.883.025.354, IRR sebesar 161%, Net B/C 1,71%, *Payback Periode* 5,59 tahun, dan BEP unit sebesar 4.441 unit.

Kata kunci: *kolang-kaling, galaktomanan, ekstraksi, model matematika pengeringan*

ABSTRACT

Production Study and Economic Feasibility Analysis of Sugar Palm Fruit Flour Agroindustry *(Arenga pinnata Merr*) in West Lampung Regency

By:

Suci Hardina Rahmawati

The sugar palm fruit (*kolang-kaling*) came from the sugar palm tree (*Arenga pinnata*), specifically found in the female fruits. West Lampung Regency was the largest producer of sugar palm fruit in Lampung Province. This study utilized sugar palm fruit to produce sugar palm fruit flour, aiming to extend its shelf life, facilitate transportation, and enhance the benefits of sugar palm fruit products. The objectives of this study were to: 1) Develop a mathematical drying model to determine the optimal drying time and temperature, 2) Develop the use of solvents to evaluate the effect of solvent concentration on the yield of galactomannan, analyze the characteristics of the flour, and identify galactomannan compounds in the best sugar palm fruit flour, 3) Analyze the financial feasibility of sugar palm fruit flour (*Arenga pinnata Merr*) in West Lampung Regency. The research methodology was conducted in the following stages: Stage 1 involved drying sugar palm fruit (kolang-kaling) using an oven with time variables ranging from 1 to 8 hours and temperature variables between 50°C and 110°C. Stage 2 was carried out through maceration with the addition of citric acid and sodium bisulfite, followed by analyses including galactomannan, proximate composition, oil-holding capacity (OHC), water-holding capacity (WHC), polyphenol content, LCMS, and FTIR. Stage 3 involved conducting expert interviews and field surveys. The results of the first stage of the study identified the most suitable mathematical model for the characteristics of the raw material as the Midili Kucuk model, represented by the mathematical equation Mr=0,9683exp(−0,0475$t^{0,8051}$) + 0,0021t. From the mathematical model equation, the optimal temperature and time were determined based on the highest R^2 value of 0.9484, which was the highest and closest to 1, this value was achieved at a temperature of 100°C with a drying time of 3 hours. In the second stage of the study, the best yield of 41.51% was obtained with a citric acid concentration of 0.1% (w/w) and an optimal maceration time of 90 minutes. The treatment with the addition of citric acid and variations in its

concentration showed significant differences at a 5% confidence level. The best yield from added sodium bisulfite was 45.72%, achieved with a sodium bisulfite concentration of 0.2% (w/w) and an optimal maceration time of 60 minutes, showing significant differences at a 5% confidence level. The best galactomannan content was obtained with the addition of sodium bisulfite at 2.01%, citric acid at 1.95%, and untreated flour at 0.80%. In the third stage of the study, the results showed an NPV of IDR 76,883,025,354, an IRR of 161%, a Net B/C ratio of 1.71%, a payback period of 5.59 years, and a BEP of 4,441 units.

Keywords: *sugar palm fruit, galactomannan, extraction, drying mathematical model*